

**MPO/RPA Quarterly Meeting**  
March 23, 2016



**LOCAL ROAD SAFETY PLAN**

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Iowa DOT

**IOWA DOT**  
SMARTER • SAFER • CUSTOMER DRIVEN

**Zero Fatalities**  
A Goal We Can All Live With

## LOCAL ROAD SAFETY PLANS



### What is an LRSP?

- Locally focused plan for practitioners to make informed, prioritized safety decisions
- Document that serves as a basis for proactive safety improvements on a county's road system
- Discusses opportunities to implement proven driver-related strategies suggested by each county's crash experience
- Provides a prioritized list of low-cost engineering countermeasures

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### Benefits of an LRSP

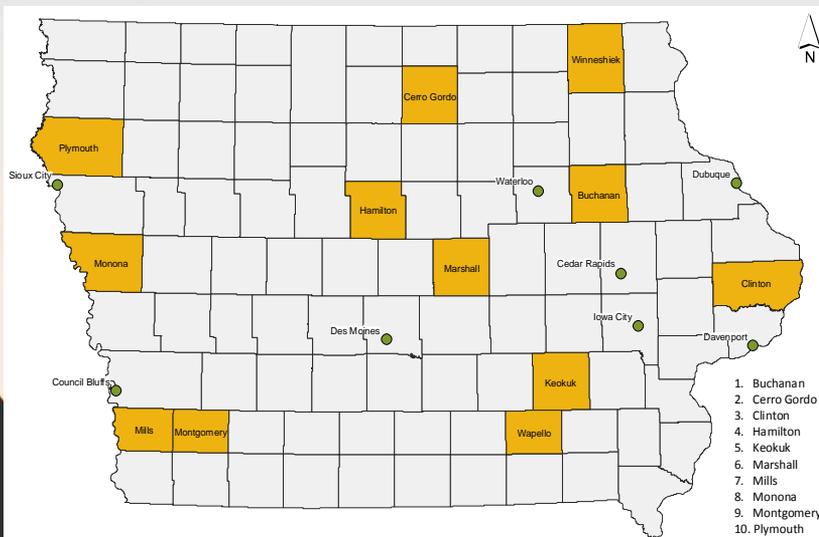
- Focuses on the five E's of safety:
  - Enforcement,
  - Engineering,
  - Emergency response,
  - Education, and
  - Everyone else
- Coordination between various agencies within the County
- Use results of the analysis to leverage and apply for funding
- No cost to participate!



## LOCAL ROAD SAFETY PLANS



### Phase 1 LRSP Counties



1. Buchanan
2. Cerro Gordo
3. Clinton
4. Hamilton
5. Keokuk
6. Marshall
7. Mills
8. Monona
9. Montgomery
10. Plymouth
11. Wapello
12. Winneschek

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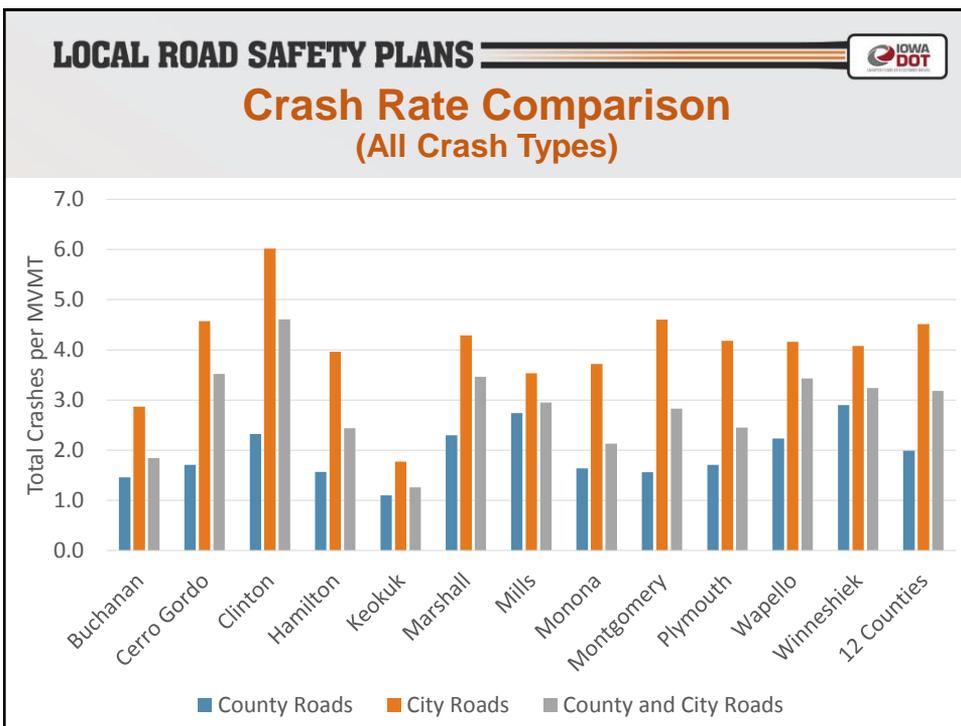
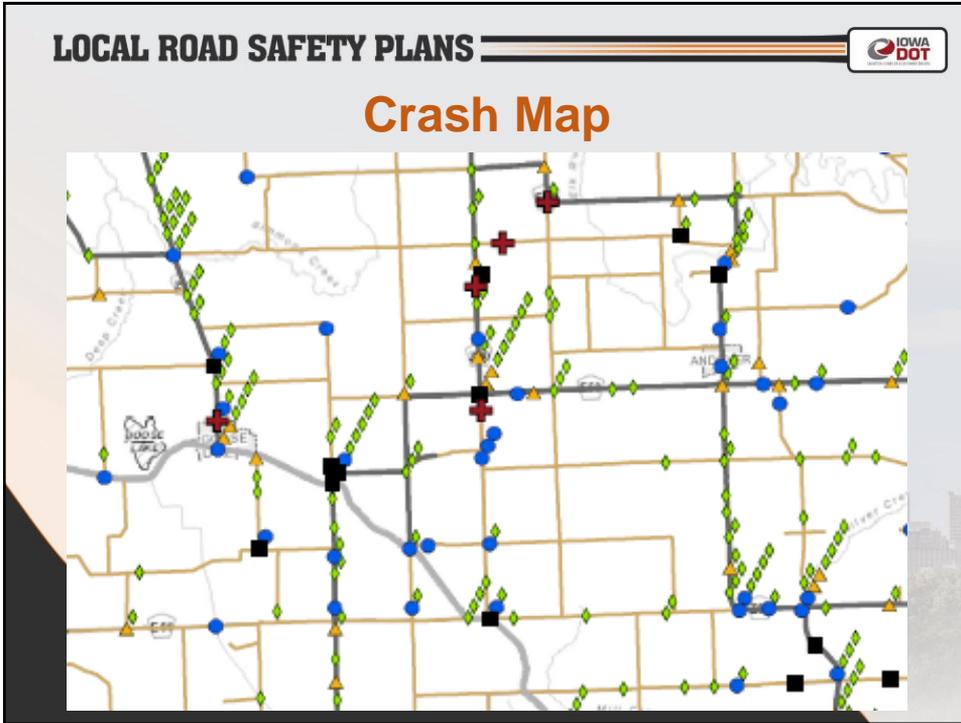
### Why is the DOT funding these?

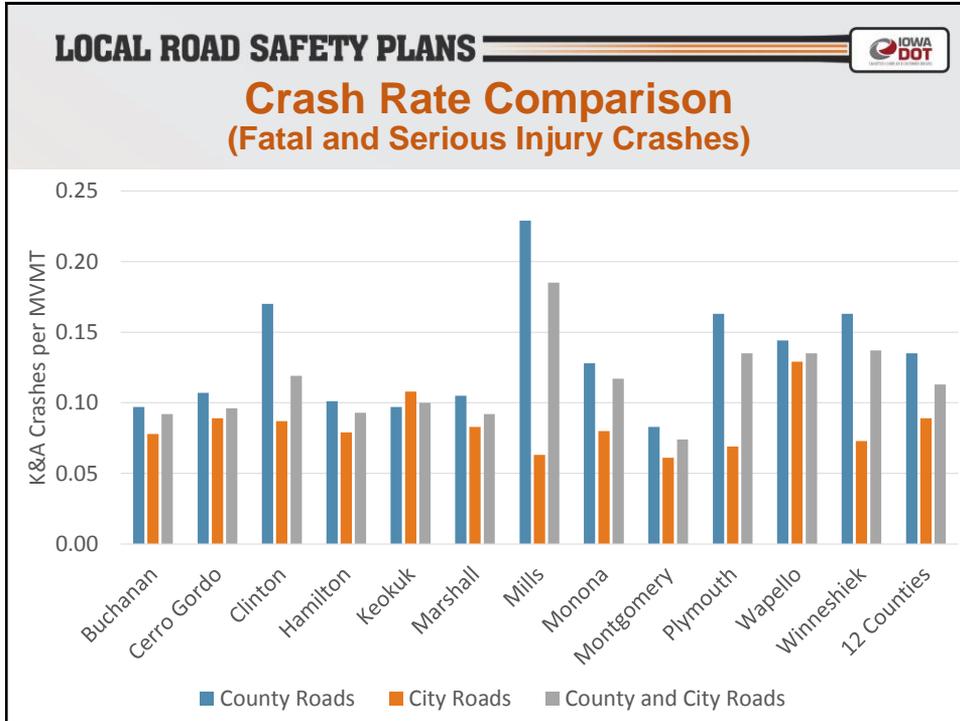
- Crash experience: over half the serious injuries and fatalities occur **off** the state road system
- County roads are less “forgiving”
  - Narrow pavement
  - Steep side slopes
  - Less clear zone
- Iowa SHSP goal: complete 15 LRSPs by 2017
- Incentive: No cost to participate!

## LOCAL ROAD SAFETY PLANS

### What are the steps in an LRSP?

- Kickoff meeting with county stakeholders
  - Present crash map and crash history
  - Discuss driver-related issues
    - Speeding
    - Impaired
    - Younger/older drivers
  - Select countermeasures
    - Rumbles
      - Approaching a stop sign
      - Approaching a curve
      - Centerline/edgeline
    - Signing
    - Lighting





### LOCAL ROAD SAFETY PLANS

## Crash Emphasis Areas (example)

Category	Safety Emphasis Area	Fatalities and Serious Injuries	% of Total	Rank	Key Emphasis Area
		116	100%	N/A	
Drivers	Younger Drivers	41	35%	6	X
	Older Drivers	26	22%	9	X
	Speed Related	51	44%	3	X
	Impaired Driving	29	25%	8	X
	Inattentive/Distracted Driving	2	2%	14	X
	Unprotected Persons	44	38%	5	X
Highway	Train	0	0%	16	
	Lane Departures	70	60%	1	X
	Roadside Collision	51	44%	3	X
	Intersections	32	28%	7	X
	Work Zone	0	0%	16	
	Local Roads	56	48%	2	X
	Winter Road Conditions	10	9%	11	
Special Users	Pedestrian	7	6%	13	
	Bicycle	0	0%	16	
Vehicles	Motorcycle	13	11%	10	
	Heavy Truck	9	8%	12	
	Other Special Vehicle	2	2%	14	

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## Sample Driver-Related Countermeasures

- Unprotected Persons (Ranked #5)
  - Conduct highly publicized seat belt enforcement campaigns
  - Discuss seat belt safety early and often in schools
  - Establish community locations for instruction in proper child restraint use
  - Have police/fire/ambulance hand out ice cream gift certificates to children wearing bike helmets

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## What are the steps in an LRSP? (cont'd)

- County road system analyzed for risk factors
  - Intersections
  - Curves
  - Roadway segments
- Features ranked on weighted risk "score"

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### Risk Factor Analysis

- Intersection risk factors:
  - Traffic volume
  - Skewed approach
  - Distance from previous stop sign
- Curve risk factors:
  - Traffic volume
  - Curve radius
  - Intersection/driveway within the curve
- Roadway segment risk factors:
  - Traffic volume
  - Pavement and shoulder width
  - Driveways per mile

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### Intersection Scoring Example

Intersection	Volume	Skewed Approach	Distance from Previous Stop Sign	Crash History	Total Score
#1	0	2	0	2	4
#2	0	1	1	0	2
#3	1	0	2	0	3
#4	2	2	2	0	6
#5	1	2	1	1	5
#6	2	0	0	2	4
#7	0	2	0	0	2
#8	2	1	1	1	5
#9	0	1	0	0	1
#10	1	0	2	1	4

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### Intersection Ranking Example

Risk Factor Points	Number of Intersections		
	County-County County-City	County-State	Total
16	0	0	0
15	0	0	0
14	0	0	0
13	0	0	0
12	2	0	2
11	0	1	1
10	3	2	5
9	3	3	6
8	49	18	67
7	13	6	19
6	2	7	9
5	0	0	0
4	23	0	23
3	3	0	3
2	187	2	189
1	21	0	21
0	8	0	8
<b>Count</b>	<b>314</b>	<b>39</b>	<b>353</b>

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### Project Selection

- Top 5-10 intersections, curves, and segments evaluated using a “decision tree”
- Decision tree considers:
  - Traffic volumes
  - Intersection type (2-way stop, 4-way stop, etc.)
  - Curve radius
  - Lane width
  - Presence of safety features

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## Project Selection (cont'd)

- Intersection project suggestions:
  - Install destination lighting
  - Upgrade signs/pavement markings
  - Place transverse rumble strips
  - Add flashing beacons to signs
- Curve and segment project suggestions:
  - Place centerline and/or edgeline rumble strips
  - Install chevrons/advance warning signs (curves)
  - Upgrade pavement markings
  - Pave shoulders

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## Recommendations

- Projects identified for top 5-10 ranking
  - Intersections
  - Curves
  - Road segments
- Single-page “project information sheets” created
- Sum of project costs should exceed \$1M

## LOCAL ROAD SAFETY PLANS

# Recommendations (example)

Facility Type	Number of Locations	Estimated Project Cost
Intersections	21	\$387,000
Curves	12	\$285,000
Segments	12	\$1,570,000
Total Improvement Costs	45	\$2,242,000

19

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**Project Location**

**Intersection Information and Systemic Ranking Summary**

Systemic Ranking Summary	Value	Points
Daily Entering Vehicles	1699	6
Approach Angle (Degrees)	43	2
Distance from Previous Stop	< 1.5 mi	0
K or A Crash	No	0
Distance from Driveway or Intersection	< 250 ft	2
Total Risk Factor Points (16 max)		10

Other Information	
Number of Approaches	4
Number of Paved Approaches	4
Major ADT	1090
Minor ADT	520
Destination Lighting	No
Transverse Rumble Strips	No
Control Type	Two-way stop

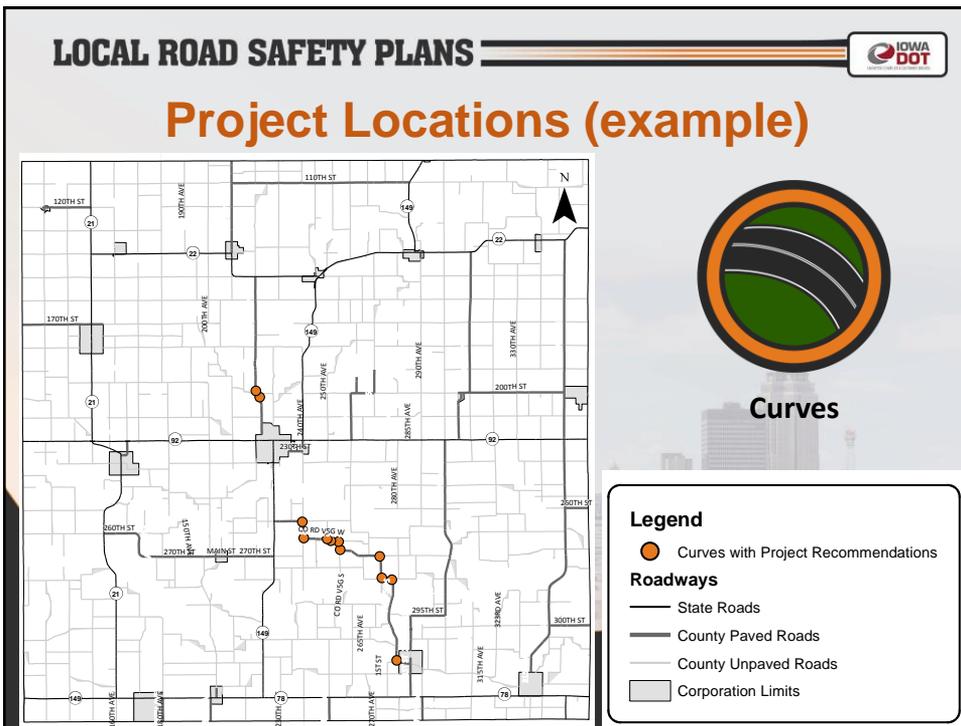
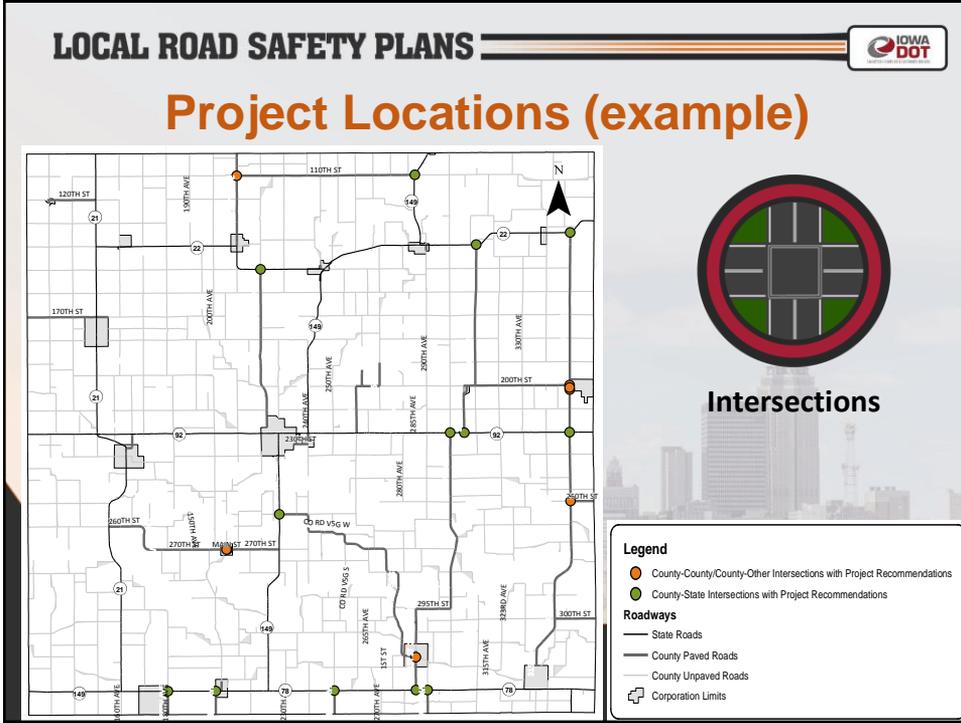
Key Emphasis Areas	
<input type="checkbox"/>	Younger Drivers
<input type="checkbox"/>	Older Drivers
<input type="checkbox"/>	Speed-Related
<input type="checkbox"/>	Impaired Driving
<input type="checkbox"/>	Inattentive/Distracted Driving
<input type="checkbox"/>	Unprotected Persons
<input type="checkbox"/>	Lane Departures
<input type="checkbox"/>	Roadside Collisions
<input checked="" type="checkbox"/>	Intersections
<input checked="" type="checkbox"/>	Local Roads

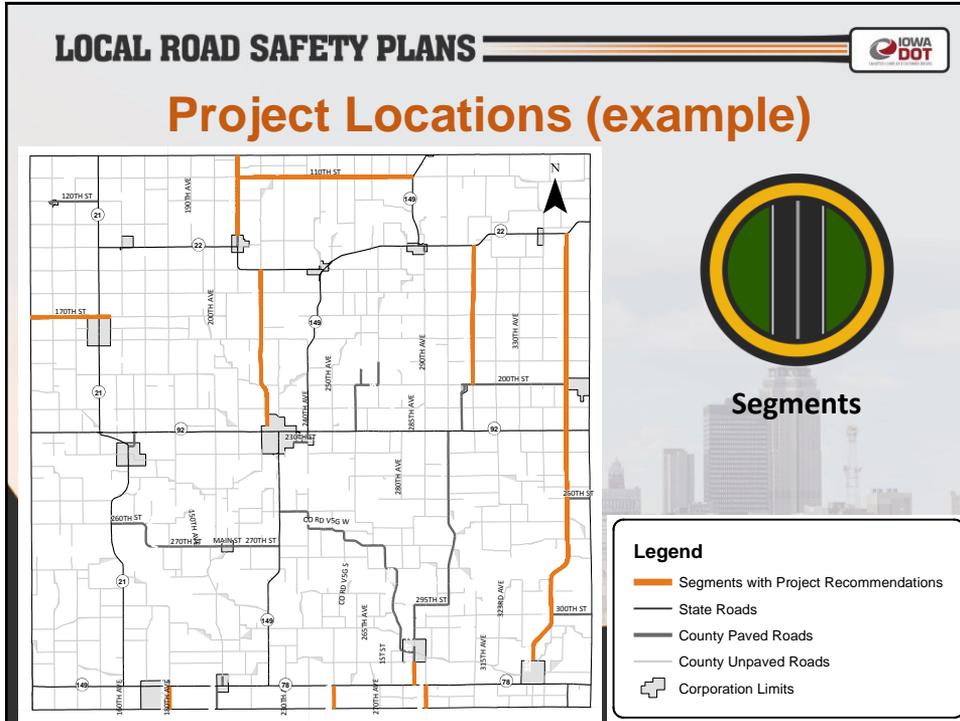
**Crash Data, 2004-2013**

Total Crashes	7
K and A Crashes	0
Right angle, rear-end, or turning crashes	5

**Opinion of Probable Cost**

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost	
	Roundabout (Single-Lane, Cost Includes Design and Construction, but No ROW)	0	EA	\$ 1,250,000	\$ -	
	Install Destination Lighting	1	EA	\$ 8,000	\$ 8,000	
	Upgrade Signs and Pavement Markings	2	LEG	\$ 2,200	\$ 4,400	
	Upgrade Stop Sign and Stop Bar	0	LEG	\$ 700	\$ -	
	Install Second Stop Sign and Stop Ahead Sign	2	LEG	\$ 1,200	\$ 2,400	
	Install Solar-Powered Flashing Beacon on Stop Sign	0	EA	\$ 2,500	\$ -	
	Install Solar-Powered Flashing Beacon on Yield Sign	0	EA	\$ 2,500	\$ -	
	Install Transverse Rumble Strips	2	LEG	\$ 1,000	\$ 2,000	
	Clear and Grub within Sight Triangle	4	LEG	\$ 1,500	\$ 6,000	
	All-way Stop Warrant Analysis	0	EA	\$ 5,000	\$ -	
	Install New Signs and Pavement Markings	0	LEG	\$ 2,600	\$ -	
<b>Basis for Cost Projection</b>					Subtotal:	\$ 22,800
<input type="checkbox"/>	No Design Completed				Engineering (% +/-)	15%
<input type="checkbox"/>	Preliminary Design				Mobilization: (% +/-)	10%
<input type="checkbox"/>	Final Design				Traffic Control: (% +/-)	5%
					Contingency (% +/-)	20%
					<b>Estimated Project Cost:</b>	<b>\$ 35,000</b>







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# Questions?

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